

1 1928 TECHNICAL DEPT.

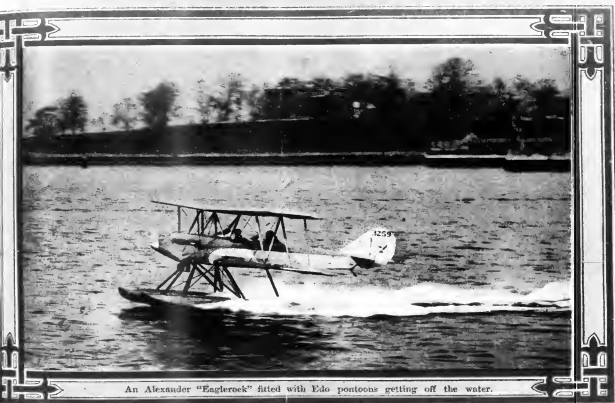
AVIATION

The Oldest American Aeronautical Magazine

JANUARY 30, 1928

Issued Weekly

PRICE 20 CENTS



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VOLUME
XXIV

Special Features

NUMBER
5

The Zenith "Albatross"
Notes on the Guggenheim Safety Competition
Near Future Developments in Navy Aircraft Engines

AVIATION PUBLISHING CORPORATION
250 WEST 57 STREET, NEW YORK

Publication Office, Highland, N. Y. Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office, at Highland, N. Y. under Act of March 3, 1879.

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HARRY ROGERS



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In oval: Main mounting assembly line taken; frame of fuselage ready for covering



Fabric being covering to a wooden form. All parts must conform exactly to the curvature of the form



Assembling frame member on a jig. Pilot seats and wing frames at left



End of assembly line: The plane in the foreground is completed and ready for its initial test

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and many others

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BACK of the Curtiss Condor Bomber are the engineering and manufacturing resources of the Curtiss Company—the only complete aeronautical laboratories in the industry, a skilled personnel that has been building outstanding aircraft and motors for numerous years, and an engineering staff that is without a parallel in skill and experience.

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WRIGHT AERONAUTICAL CORPORATION

Paterson, N. J., U. S. A.

WRIGHT



The Oldest American Aeronautical Magazine

Vol. XXIV

JANUARY 30, 1928

No. 2

The Reaction

THE FAILURE of many of the transoceanic flights has furnished a rallying point for certain reactionaries who claim that the airplane has never really progressed since it was invented by the Wrights, and that it never will progress to any appreciable degree. Such statements and arguments are put forward by some with entire sincerity, but with others the motive is entirely essential. Every paper, be it a daily or weekly, tries to be somewhat different and original. The sentiment in favor of aeronautics has been an overwhelmingly strong that certain papers feel that they will attract attention to themselves if they take an opposite stand. The same is true of the writers in the editorial, sports and articles boasting flying is pretty well played, and the writer who brings out arguments against flying is following an original line which is more apt to attract attention.

Those who are familiar with what is going on in the aeronautical field are little influenced by reactionary articles, but the general public not knowing the facts is considerably influenced. In spite of all the publicity such aeronautics has received during the past year the public is still profoundly ignorant of the fundamentals of flying. Those who have the interest of aeronautical progress at heart should not relax in their efforts to educate the public. Flying meets, aeronautical exhibitions and lectures all help the cause and are worthy of support.

The Reason Why

THE QUESTION is sometimes asked as to the reason why AVIATION does not publish news accounts of various airplane accidents. To begin with, the reason is not because of the fear that such publicity would be detrimental to the cause. Since its inception AVIATION has never attempted to conceal any information that would be of vital interest and importance to its readers. Nor will it attempt such a procedure in the future.

New accounts of airplane crashes are omitted from the columns of AVIATION because in a great number of cases it is almost impossible to ascertain the direct cause, or causes, of the accident, and the major interest of such accounts to the person directly associated with the industry—the man in whom AVIATION takes particular—in the causes of the accident. The motive being accident research as a means of securing greater safety. However, the opinions of eye witnesses often differ considerably. This point was well illustrated by

two accounts of a recent accident that were sent into this office. The details of each account were direct opposites to the other. And it is altogether possible that had we witnessed the crash ourselves we would have put forth a third opinion.

Therefore, in view of the facts, that, the vast AVIATION reader interested in accident accounts is in the details of causes, which in many cases are impossible to discover, and that even the opinions of experts differ many times, and that it would be impossible for us to witness every airplane crash, why devote space to what most necessarily is considered as hearsay when there is so much other more important trade information available?

AVIATION is firm in the belief that by analyzing crash causes, progress can be made in the development of safer airplanes and safer flying. And AVIATION favors such an idea as the Department of Commerce, or some other reliable body, conducting investigations of airplane accidents to determine if possible whether the cause was structural failure or pilot carelessness, and we would most seriously publish the findings of the various investigation committees. But until such time comes—and it may be in the very near future—when crash cause information can be obtained from some such authoritative source we will refrain from giving space to airplane accidents as we do not feel that the ordinary news account of a crash is of sufficient value to our readers as to warrant the publication.

The 1928 Tour

A MOST IMPORTANT and altogether commendable arrangement planned for the 1928 National Liability Tour is that of allowing the visiting planes to make two night stopovers at all the large cities visited. One of the main objectives of such tours has been to educate the public in the progress of airplane design and performance from year to year. However, in the three previous tours little time was allowed for the public to really inspect the planes, much less permit manufacturers' representatives to demonstrate their products to prospective dealers, or customers.

Under the new arrangement the difficulty will be considerably reduced, and it behooves all manufacturers who enter planes to acquaint their dealers, at the various centers to be visited, with full details so that they in turn may make arrangements to have their prospective customers visit the local field while the Tour planes are there. If some of the visiting manufacturers are not represented by dealers at certain cities then the two night stopovers should prove most helpful in signing up logical prospects.

TABLE I. EXPERIMENTAL RESULTS FOR FLAPS PARTAKING OF THE CHARACTER OF AIRBUSHES IN TENSION

[illegible]

short 32% of the wing chord, a flap depression of 28° increased the lift some 27%. Further depression of the flap produced an appreciable increase in lift. In the application of flaps to airplanes, disadvantages may be in the fact that if very large flap movements are required upon a given high maximum lift.

The slotted rear fairs show up universally a little better than the unslotted rear fairs, from the point of view of maximum K_y . The rear slot, properly designed, has no detrimental effect on the L/D at high speed.

An interesting addition to our knowledge of the structure of the flag is given by a recent Göttingen publication.^(*) The underlying idea is similar to that of the Hoadley-Pagel model, when the flag is depressed at high angles of attack.



Fig. 2. A type of front slot recently tested at Göttingen stream of air passes upward through the slot and disintegrating. The shape of the undersurface is evidently designed to assist such a flow.

In the first Orthogon, arrangement shown past from 10 bottom of Table 2, with flap raised -37° , maximum L/D is 27.4 and maximum C_y 0.0037 at 18.5° incidence. With flap depressed to $+37^\circ$, maximum C_y becomes .0048 at 2° incidence. With the flap depressed to $+43^\circ$ maximum C_y becomes 0.0055 at 12° incidence.

Starting with a thick double numbered aerial of wire, bent left and of good efficiency, it is therefore possible to use 0040 for maximum Ky without too much key depression, for a slotted gap design of this type, and L/D of 90 maximum Ky should also be obtainable. The thick double numbered aerial as in the Göttinger experiments has the further great advantage of having its maximum L/D at a value of Ky that is in the high speed region.

β. Full Sample Effects on Play

Scale effects in connection with Raps have been the topic of several experiments. Recent British tests (²), in which full flight values of lift and drag were compared with:

Model	LN	LN	LN
1	25.9	47	50
2	50.7	50.7	50.7

At the same time it would appear that the fall 1977 is well represented by the fall 1976 and 1977 average. The 1977

p. Front Shots, and Front Shots in Combination with Rear Shots.
An extraordinary amount of experimental work is done.

[28] Untersuchungen an Fliegen mit Stoppfen und 19.
des Jahreszehntausend Versuches. In: *Zeitschrift für*
Physik 19, 1902, S. 100.

Type of Joints	Average maximum number	Average increase in max Ky	Bubbling angles of lower end in different sections	Average change in maximum left angle
EFFECT OF FRONT SLOT ALONE				
Flask	14.67%	35.8	18.5° to 24.23°	6.45°
Sodium	12.1%	44	22.91° to 29.39°	7.34°
Pin	7.2%	68	14.12° to 25.1°	10.98°

EFFECT OF SLOTS AND FLAPS COMBINED

Teak	15.8%	43	18.47" to 22.04"	0.67"
Sapele	22.1%	66	12.91" to 13.75"	.54"
Okou	7.1%	70	13.37" to 17.83"	4.86"

Ladewski has obtained an extraordinarily high lift value for a tapered thick wing, namely around 0.9025. The base airfoil however was very inefficient, and it does not seem likely that designers will seek to achieve such very high lift coefficients without incurring a corresponding loss in efficiency at high speed.

Some birds, as we proved, had those of Leachman, with slot sizes have been made at Göttingen (¹⁴). In this arrangement (Fig. 4, b) was the position of the secondary surface in the light, and a in shadow light. In the arrangement of Fig. 3 where the secondary surface was swung about the hinge point D. For the first arrangement, the efficiency in normal incidence only fell with a maximum L/D of 19.6, with the secondary surface light position about the hinge point Ky was 60.3% in the second arrangement on the central shaft of the wing. In the second arrangement with the slot angled, the maximum L/D was 14.2; with the slot swung open the maximum Ky was 66.02 at 25.6° incidence. None of the Göttingen tests took particularly promising.

Under the advantage of the mechanism involved in foot flat has a tendency to raise the angle of attack a maximum Ky, even with rear flap depressed, to somewhat higher values than the designer would like. This not only was a longer shank, but also greater difficulty in lateral and longitudinal control. The combination of the Wing ribs, tested with the front flat, as shown in Table I, was the a happy one. A maximum Ky of 0.0546 is obtained by a small angle, with an incidence of only 15 deg.

The total shift in comparison with rear leg has the advantage (not indicated by the table) that the L/D falls off the rapidly beyond maximum K_2 . This makes for steady drive, too, as noted.

Ample auxiliary surfed dunes which have been treated in the Waquoit Bay National Estuarine Park (see Fig. 6). Here the auxiliary surfed dune was held in a fixed position. Six sets of tests have been disappointing; the average lift is only about 72 per cent for the best setting tested. Although the actual increase in area by the introduction of the auxiliary dune was 20 per cent, this does not mean that

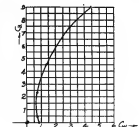


Fig. 7. Curves of lift coefficients plotted against drag coefficients (in dynamic absolute units) for a rotating cylinder with end plates.

ever that some position for the auxiliary airfoil may not be found which will increase maximum lift, yet not decrease efficiency in normal flight.

In a series of full flight experiments with the B. Figher[®], a slot and flap adherer control was tested in positions with slots and flaps on the vent of the wing. The mean flaps down 15° and the adherers down 15°, no slot open, the maximum lift coefficient was 0.0125, an increase of 82 per cent over the highest value of 0.007 of basic RAP 15 wing section. These tests are particularly valuable, because lateral control can be considered as the production of high lift, and it may not be advised to depress the adherers to flight as far as the center flap.

B. Social effects on state and flow

For the designer, it is important to estimate such data as available regarding scale effect on shodded wings.

Full scale experiments with wind tunnel tests have been made by the British (2) on a model of the Bristol Jet equipped with a small leading airfoil which when chosen a good high speed section. In the case of the small airfoil, maximum C_x obtained in the tunnel was 0.0319; full scale, 0.0319, and in both cases at 25° incidence, the case of the large leading airfoil, maximum C_x is 0.0450; full scale, 0.0436; with incidence 25° and 28° respectively. The model drag curves show at higher values of the skin friction coefficient than the full scale. There is a sufficient discrepancy for the δ -layer manager while effort does is not avoided.

With a microscope placed

proved the maximum L/D improves some 30 or 35%. This therefore has certain advantages from the point of view of the off gas, with a low wing aspect ratio. The improvement in maximum lift is but very small, the maximum lift going up only 20 per cent, when the mastoplane is one-fourth of

[29] Untersuchungen an Fliegeln mit Flügeln aus 100% des Insektenwachstums-Förderstoffs Dr. Schöner's Insek-

(19) 240 and dead at the United Flockers with Fairy Fox (1) 240
 groups by S. P. Jones, A. S. Gagnon, R. O. Brown and C. E. Gagnon
 Journal of N. N. 1944

Although the actual increase is aided by the introduction of the new, on dist was 20 per cent. They does not mean how

1936 die gesundheitlichen Verhältnisse. Es ergaben sich Folgergebnisse über den Zustand der natürlichen Freiluft.

Boundary Flaps is experimenting with front auxiliary slots which open automatically when the incidence of the airfoil reaches something like 15 degrees, and a system of concentrated suction registers at the upper surface of the wing at the leading edge.

The Parker Variable Camber wing was designed to be purely automatic in action, but there is no particular reason why the wing should assume any particular camber at different flight speeds.

In the Fawcett Variable Camber (?) device the flaps are played as like normal ailerons, except that they extend over the whole span of the wing. When the machine is at rest the flaps are held down at an angle of approximately 15 degrees in the normal high-speed position by a stiff spring. With increasing speed, and backward movement of the center of pressure, the trailing flap gradually rises. The action is then purely automatic. The de Havilland company reports that the attitude of the machine changes very little with speed variation, that landing speed is decreased, and that the steepness of the climb is increased by the use of the flaps.

Review of High Lift Devices

The following discussion as to the various high lift devices can only be regarded as tentative.

(a) Rear flaps, preferably slotted, if pushed to the logical limit so that they can be depressed to large angles are the

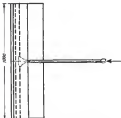


Fig. 13. Diagram of arrangement used by Searall in shooting off under pressure in the boundary layer.

made to give maximum K_y values of .8045, with good efficiency at high speed.

(b) The Wing type tandem airfoil can be made to secure maximum K_y values of .6015 without excessive flap depression. The structural difficulties will be somewhat greater than in the case of the simple rear flap.

(c) The Handley Page front slot is a suggestion with the rear slotted flap can be made to increase maximum lift power.

(d) The de Havilland device has been tested, and the results are as follows: The device was tested on June 1, 1927.

fully, beyond $K_y = .800$. The disadvantages lie in the small planform and in the high angles of attack at which maximum K_y is secured. The calculation of the Wing type can be felt with the front slot device, however.

(e) Variable camber does not seem worth a great deal.

(f) Variable area per se does not seem a promising line of attack. Variable area devices which are so arranged as



Fig. 12. Diagram for suction experiments by H. Searall.

to increase the camber automatically with the wind, should be as powerful as regards maximum K_y as the front and rear flaps. If the mechanical difficulties are overcome, variable area should be worth considering.

(g) Rotating cylinders however arranged are not within the realm of practical possibilities.

(h) Air injection is likely to increase production power loss.

(i) Forward of the boundary layer by suction is an extremely powerful line of attack and deserves intensive study.

Continued in Next Week's Issue

Los Angeles Business Men Donate \$25,000 For National Air Races

INTEREST IN bringing the National Air Races to southern California in 1928 was well displayed during a meeting of the National Aeronautic Association held recently at the grand hotel, when Los Angeles business men contributed more than \$25,000 toward the cash prizes to be awarded.

One of the greatest factors concerned with bringing the races to this section during the fall of 1928 is that the great air personalities of the world and the most powerful air forces in this country will take place it is said, at that time when the two aircraft carriers, Langley and Lexington, join the Pacific fleet for fall maneuvers.

It was also considered of importance that the first cruise made in this world was made at Dominguez Hill, Southern California, in 1911, that such of the pioneer experiments was done in this vicinity, and also that 1928 is the twenty-fifth anniversary of the first flight of a heavier than air machine.

More than twenty eight companies contributed to the prize fund. Among them were the Douglas Co. of Santa Monica; American Aircraft Corp., Rogers Airport, Malibu; Airline, Bush Aircraft, Ltd., The Aero Corp. of Calif., Burbank; Air Lines, Inc., L. A. Airways, and California Airways.

Appointed to Eaglerock Agency For Entire State of Minnesota

THE MINNESOTA Aircraft Company, 400 6th Ave., Minneapolis, Minn., has been added to the Alexander Aircraft Company's list of distributors, and has been allotted the entire state of Minnesota.

Near Future Developments in Navy Aircraft Engines

By LIEUT. COMDR. J. M. SHOFMAKER, U.S.N.

Chief of the Engine Section, Bureau of Aeronautics, Navy Department

UNTIL the present year, the efforts of air cooled engine manufacturers have been directed mainly toward attaining the utmost in reliability. Air cooled engine evolution, having inherent weight advantages, has not only a great advantage, but also in the elimination of coolers, our loss, pump and water.

Although engine failures due to cooling system defects are constantly minimized, it remained for the remarkable flight of 1927 to prove that air cooled engines are at least the equal of water cooled engines as regards reliability, and in all matters of weather and temperature.

Being gained the confidence of the world in their products, American manufacturers of air cooled engines are taking steps toward refining and improving them. In addition to possible radical changes in engine design, improvement in present engines may be expected along the lines of bettering up the horsepower and reducing the specific fuel consumption. These improvements are possible due to:

(a) The workmanlike design of the present engines, and their undoubted ability to stand higher loads.

(b) An ability of greatly improved aviation gasoline. Fueling the development of lightest weight fuels, the development of Ethyl Fluid, and its extensive use since 1925, has greatly improved the anti-knock qualities of domestic aviation gasoline. This has made possible the successful use of modern engines on motors (specifically those) built with normal anti-knock characteristics are extremely low. Ethyl Fluid could be used in any concentration, engine compression ratios might be raised to almost double that of present engines without regard to the natural anti-knock qualities of domestic aviation gasoline. Unfortunately

only, however, excessive use of Ethyl Fluid has a very deleterious effect on valves and valve seats.

It has always been possible to give gasoline specifications which, by requiring a certain critical temperature of solution with ammonia, automatically shut out gasoline distilled from petroleum base crudes. This requirement, however, is not in conformity with the Federal Specifications Board specifications



A B-12 25 powered with a 300 hp. water-cooled Buellman-Middle motor.

for aviation gasoline. The Federal Specifications for gasoline as revised this year allow the military services to establish an acceptable list of approved aviation gasoline based on samples submitted for test. This will enable the Navy to establish a standard anti-knock value which must be specified by any gasoline before it is placed on the acceptable list. Several large oil companies have been conducting extensive experiments with a view to producing an aviation gasoline with high anti-knock characteristics, and these fuels will be ready to meet the Navy's requirements in the near future.

The means employed for increasing the power output of the Navy's present engines may be:

(a) Increase the R.P.M.,
(b) Increase the compression ratio,
(c) Supercharge.

The first step in this direction should be to increase R.P.M. and supply maximum allowable compression ratio with full throttle, sea level operation. On top of this, engines may be supercharged by gear ratio power at full throttle at a predetermined altitude. This will necessitate the use of a throttle stop to limit throttle opening until a safe altitude is reached. The rotary induction system of fuel distribution



View of "Mitsubishi" 1000 H.P. in the short running airplane "Mitsubishi". Note the "T-10" as shown on the top cylinder and the distance between the engine and the propeller.

now in use in modern radial engines leads itself beautifully to supercharging, as all that is required to obtain almost any desired manifold pressure at sea level is a change of impeller gear ratio.

The extent to which a service engine can be gradually stepped up in power is best exemplified by the Inrock Bristol Jupiter engine series. All of these engines are nine cylinder, star, radial, air cooled, direct drive. The following table illustrates this:

Year	Number of Firms	Number of Firms in D.A.O.	Number of Firms in D.A.O.	Number of Firms in D.A.O.	Number of Firms in D.A.O.
1974	101	101	101	101	101
1975	101	101	101	101	101
1976	101	101	101	101	101
1977	101	101	101	101	101
1978	101	101	101	101	101
1979	101	101	101	101	101
1980	101	101	101	101	101
1981	101	101	101	101	101
1982	101	101	101	101	101
1983	101	101	101	101	101
1984	101	101	101	101	101
1985	101	101	101	101	101
1986	101	101	101	101	101
1987	101	101	101	101	101
1988	101	101	101	101	101
1989	101	101	101	101	101
1990	101	101	101	101	101
1991	101	101	101	101	101
1992	101	101	101	101	101
1993	101	101	101	101	101
1994	101	101	101	101	101
1995	101	101	101	101	101
1996	101	101	101	101	101
1997	101	101	101	101	101
1998	101	101	101	101	101
1999	101	101	101	101	101
2000	101	101	101	101	101
2001	101	101	101	101	101
2002	101	101	101	101	101
2003	101	101	101	101	101
2004	101	101	101	101	101
2005	101	101	101	101	101
2006	101	101	101	101	101
2007	101	101	101	101	101
2008	101	101	101	101	101
2009	101	101	101	101	101
2010	101	101	101	101	101
2011	101	101	101	101	101
2012	101	101	101	101	101
2013	101	101	101	101	101
2014	101	101	101	101	101
2015	101	101	101	101	101
2016	101	101	101	101	101
2017	101	101	101	101	101
2018	101	101	101	101	101
2019	101	101	101	101	101
2020	101	101	101	101	101

The above task is a striking illustration of a "reverse" in focus in the assignment of the two basic reasons. The reasons of power in the chapter VI read the chapter IV is not merely the higher compression ratio and better engine. The G-60 compression ratio chapter VI is selected for attack work. The engine increases a thrust step and half thrust is not well below 5000 ft altitude. The Bird-Bled air engine is a step up the chapter with particular attention paid to reduction of diameter, and with a general assessment incorporated.

The two columns on the right give the general characteristics of the two large displacement American radial engines. Each of these engines has a built-in rotary induction system.



A Pratt & Whitney "Wasp" engine installed in the Wright "Aquila" plane.



Final quarter mile of the 122 sp. Profit of Whitney-Mason
runway

A comparison of the American engine with the British one would seem to indicate that either the Cyclone or the Horn is capable of having its output increased considerably if the means previously discussed.

[illegible]

Speed Too High for Good Propeller Efficiency

It is noted from the table that the Mercury engine (compared to rated power) at 2500 rpm. This is entirely too high for a good propeller efficiency except on a propeller of extremely low speed, far below the Mercury engine is intended. Using the maximum speed is a comparatively simple matter when choosing any compressor, however, provided the compressor is designed for the speed of the engine. A good propeller efficiency with a reasonable propeller diameter (18 in.) is indicated that the Jupiter Series VIII engine (compressor) is not designed for, and this probably means that the maximum speed has been raised. Both the Horner and the Jupiter Series VIII engines are fitted with reduction gears which may become valuable for these engines when used at comparatively low speeds, here, 450, rpm.

The designers of the Harnai and the Cyclone are almost as obtaining the desired power with engines of the most reliability and the minimum possible weight, and they build out engines which, while extremely satisfactory to certain power plants, do not lend themselves to streamlining as to

a day night. The two means by which power plant residue is a. Surrogate may be reduced irrespective of the type of waste employed are:

(b) A reduction in engine frontal area,

(d) Increase in the longitudinal distance between the proximal hub and the maximum major diameter.

The diameter of the Jupiter VI is two inches less than that of the Jupiter IV. This has been accomplished by shortening the cylinder, shortening the connecting rods, and reducing the diameter of the combustion valve retaining the same stroke. The diameter of the Mercury is four inches less than that of the Jupiter VI, which reduction is due to the one-half shorter stroke plus redesign of valve opening gear. It is probable that the diameters of the Hornet and Cyclone will be reduced in somewhat the same manner.

Covered Radials Automatically Leathered

balancing the crankshaft of a radial engine is not the easier task. Neither so exact of the engine would seem to have fewer difficulties than that of reduction in engine mass. There is very little difference in this respect between the Jupiter IV and VI, but particular attention was paid to the service in the design of the Mercury, on which tapered cover of the crankcase was lengthened and tapered, and inlet valves are automatically lengthened by the action of the usual camshaft gear in the front crank-

The idea of building engines to fit airplanes, as described here in one short wall, it is hoped, influences American engineers during the next year. A further step, and a serious



[†] Under Mechanical Engineering in Columbia.

tightly logical case, it is left upon engine manufacturers to supply with the engine a suitable exhaust manifold and suitable engine nose cowling. The design of both of these engine fittings is extremely important in achieving successful power plant operation, and it will be distinctly to the advantage of engine manufacturers to control such design. Literature in this country, both the engine cowlings and the exhaust manifolding have been provided by the airplane manufacturers.

The results of attempts to cool radial engines by airplane designers have been in many cases not too good. There is as much chance of overheating an air cooled engine as of overcooling it, and in addition the cooling should be adjustable in the air for various temperature conditions. The engine manufacturers know the operating temperatures at which their engines run best, and how the cylinders can best be cooled.

The provision of exhaust manifolds by engine instead of engine manufacturers should be a marked improvement, as engine manufacturers are usually interested in insuring that the exhaust manifold, used with their product not only do not build up back pressure, but are an integral and successful part of the power plant assembly.

Reciprocating air-cooled engines are not, necessarily, the best way to a compact power plant. They have, however, reached a high state of development. Their adoption for all Naval airplanes as well as their general use commercially, is due to the widespread confidence in their reliability and ease of maintenance coupled with the great saving in power plant weight that they make possible. The soundness of design of present radial engines insures the possibility of increasing their power with no increase in weight and no decrease in reliability.

In conclusion, I would like to emphasize again the two thoughts that prompted this article. They are: "More power to the reds!" and "Build congress to fit capitalism."

Alexander Milburn Co. Has Light Weight Cutting and Welding Torch

OF INTEREST in machine manufacture is a new light weight combination cutting and welding torch developed by the Alexander Milburn Co., Baltimore, MD. The Milburn Type RI, as it is called, promises fine work in the welding of steel fastenings and in many construction

The new torch cuts or welds with the more interchange of tips and is made to operate with either oxygen and acetylene, oxygen and hydrogen, or other gases. The use of two torches or the necessity of disconnecting the hose from the torch valves when a change from cutting to welding, or vice versa, is made, is no longer necessary. The torch weighs but 46 ounces, yet it is equally efficient on light or heavy metals and will cut upwards of 10 in. in thickness.

Order For Sixty Waco-10 Planes Is Given By Rankin School Head

Order For Sixty Waco-10 Planes Is Given By Rankin School Head

WHILE IN the East to attend the recent air congress in Washington, D. C., Ted Barker, head of the Rasmie School of Flying, Spokane, Wash., placed an order for 60 Waco-10 biplanes at the Troy, O., factory for immediate delivery. Three of the planes have already been sold to Nick Mauser, Spokane, Wash. Waco dealer.



The first flight of the "Albatross" at Midway City Airport, Santa Ana, Calif.

The Zenith "Albatross"

New Large Parasol Monoplane Powered With Three 125 Hp. Siemens-Halske Engines Performs Well During Tests

THE ZENITH "Albatross," constructed by the Zenith Aircraft Corp., Santa Ana, Calif., and said to be the largest parasol monoplane ever completed, has made three test flights with a total duration of more than one hour and has flown so satisfactorily that the designers, Charles F. Rockwell and Allen K. Peterson, are well satisfied with its performance.

This plane has a semi-monoplane, externally hinged wing of 98 ft. span and is designed to carry 14 passengers and baggage in a maximum speed of 160 m.p.h. with a total rated horsepower of only 375. Because of the fact that it is designed to fly on approximately half the power used by other planes of this size, many persons have scoffed at the ability of the plane to fly at all.

In the recent tests the plane showed much remarkable flying qualities, taking off in only 100 ft. and landing at a speed of 25 m.p.h. with a run of approximately 300 ft. Three tests were made with two pilots, 375 gals. of gasoline and 30 gal. of oil. The Albatross climbed 3000 ft. in four minutes, flew at a speed of 95 m.p.h. and throttled down to a slow speed of 30 m.p.h. Both Mr. Rockwell and Mr. Peterson, who was former Navy aviator, say that the plane landed beautifully and is superior in ease of control to the latest type of trim-corded biplane. This plane, built easily and at an altitude of 25,000 ft., is expected to be an easy performer for it.

The design of the Albatross was started some months ago by Mr. Rockwell and Mr. Peterson while both were still in

the Navy. Mr. Rockwell had built four monoplane air-craft of the high efficiency type and Mr. Peterson had built a low horsepower monoplane of very good performance. The two men got together and found that their ideas on design were similar, both of them seeking to get away from high horsepower and to build for lightness without sacrificing strength.

The design of the Albatross was completed while the men were still in the Naval Air Service and it was not until some time in August that the Zenith Aircraft Corp. was formed with Working Price, of Santa Ana, as president. The capitalization of the company is \$250,000 and it is a stock corporation, all financing being raised for by the amateur builders with no prospect of increased capitalization or public offerings of stock sales unless orders should demand or medium expansion in which case it would be necessary to sell its outside capital.

Tested at Midway City Airport

Following the completion of the Zenith Aircraft Corp. the designers of the plane obtained a hangar from the present owner, gathered an expert group of workmen there and started construction in a hangar and using a Midway City, near Santa Ana, as a early test of the new design by the Navy. This early test field has been used Midway City Airport and commercial flying is now in progress there, the field being approximately 2,000 ft. by 1,200 ft.

The Albatross was completed in less than 60 days and it

January 30, 1932

said that the factory is now equipped to produce one of the planes each month. It is planned that additional equipment, buildings and personnel will soon increase the plant capacity to one plane per week.

In the future the Zenith factory plans to produce three models, all of the same general characteristics as the Albatross and all powered with three-siemens engines as standard equipment. The planes to be produced will be three, all of which planes, with the twelve plane plane as the chief product.

Plan to Make Endurance Flight

Here, in the Albatross will for full load tests at Santa Ana, San Diego, which will probably be completed before the end of the year, and an attempt on the world's endurance record for sustained flight will be made at some time after an earlier endurance flight. For the endurance flight the Albatross carries a 500 gal. gasoline tank in the main cabin and wing tanks with a capacity of 500 gal. It is thought that the Albatross will easily pass the early hour work.

Charles F. Rockwell and Allen K. Peterson will be co-pilot on the endurance flight with W. L. Skidmore as radio operator and relief pilot. Mr. Rockwell was chief mechanic in the Ford-MacMillan expedition and on the Ben Wyatt Hudson survey expedition. Mr. Peterson was the chief photographer on the Albatross Survey.

Following the attempt on the world's endurance record the latter plane to commence production on the Albatross type, nature unless for several of these planes being already on hand.

The excellent performance of the Albatross is due to a constant effort to produce a plane that will fly on low power. A very careful lightening of the structure has been made and the greatest care has been taken to obtain maximum efficiency from wing and propellers.

The Albatross has a wing spread of 98 ft. The chord of the wing is 12 ft. built at the root and tip. The wing tips are built up with light wood ribs and steel tube framing. The wing ribs in fabric are dished from the spar forward. The wing is semi-monoplane, a center plate over the main spar at left and right spars integrated. The spar itself is two by 10, 14 in. by 5 in., with 1/2 in. plywood plates on the outside. In addition there is a built up Warren truss inside, all 1/2 in. by 5 in., as spars members. Each spar weighs 145 lb. The total spar weight being 290 lb. Front and rear spars are identical.

Gottagen 300 Wing Section Used

The wing curve is a modified Gottagen 304. The wing is an open end section apart, have a maximum depth of 10 in., weigh 150 lb. each and will each support a load of 10 lb.

The Albatross is open construction with cable and lattice bracing system, and are carried on a false spar by wires.



The composite spar of the Zenith Albatross is shown. It has a span of 98 ft. and an area of 1800 sq. ft.

AVIATION

kings. They are of shielded type with an area of 20 sq. ft. each.

The composite members between the wing ribs are steel tubes and heavy ribs. The drag bracing is made of wire. The total weight of the wing is 1300 lb. and the total wing area is 1800 sq. ft. The full wing loading when carrying a maximum load of 15,000 lb. will be 11 lb. to the square foot. The wing is attached to the fuselage at the cabin with four li-



Allen K. Peterson (left) and Charles F. Rockwell, designers of the Albatross

brings, while two struts on each side extend down parallel to each other from wing to lower fuselage fittings.

The fuselage consists of one with fittings weighs 700 lb. Welded steel tubing in Warren truss structure is used throughout. Fuselage tubing being one and half inch 18 gauge to one inch 18 gauge, all tubing lapped outside, with oil and varnish inside, to prevent corrosion.

The length of the plane is 58 ft. overall and the height is 33 1/2 ft.

The fuselage is adjustable on the ground only and has an area of 500 sq. ft. The horizontal stabilizer is adjustable in flight and has an area of 70 sq. ft. The rudder is balanced and has an area of 18 sq. ft. Total flying area is 54 sq. ft. All tail members are constructed of steel tubing.

The fuselage streamlining is accomplished with light steel tube outline form and spars facing to carry the fabric.

The fabric is light weight Flightex stretched to the wing ribs at three inch intervals.

The landing gear has a tread of 35 ft. and is constructed of heat-treated steel tubing with 35 in. by 8 in. wheels. The shock struts are Aerial type PC-4 which extend to the fitting on the main forward wing strut just below the outboard nacelle.

Each engine nacelle complete weighs 555 lb. and is covered with duralumin on forward section and fabric over rear section.

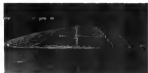


The staff of the Xanth Aircraft Corp.

two. Each is supported from wing span by two struts to the forward spar and one strut to the rear spar. Additional struts run to each main support below the nacelle and a strut which carries the nacelle extends horizontally from the fuselage to the nacelle structure.

The three size cylinder Ryan-Sumner engines rated 125 hp. each are so installed that superchargers may be added without any change in fittings, room being allowed in nacelle and nose mounts. The oil tanks are carried for each engine directly below the space reserved for superchargers should they be installed.

Engine control is by positive angled rods. Fuel is fed by gravity from wing tanks, a pump supplying the wing



The wing of the Xanth before covering

tanks was fed from the main tank in cabin. Fittings are provided so that fuel may be sent from any tank to any engine. The fuel tanks are 25 gallons, transparent steel.

The pilot's seats have been placed ahead of and slightly above the main gasoline tank. There is an emergency exit door on the right side of the pilot's cabin and one in the rear of the cabin. The main entry door is on the left side about midway of the fuselage. Two comfortable bunks have been installed on top of the fuel tank and an aisle along

the center of the back provides easy movement between deck and rear of cabin. The dimensions of the main cabin are 5 ft. 5 in. wide, 7 ft. high and 14 ft. long.

Forward cabin windows are plate glass and rear are heavy lexan. All painted surfaces are bare and oxide sprayed with wax running over pulleys from a Dupont-DuPont system.

The propellers used on the Xanth are of wood without two built by C. B. Story of Glendale, Calif., are 7 ft. 8 in. in diameter and of 7 ft. 8 in. pitch.

The Xanth has been named experimental license number X-3025, by Capt. Walter Parson, aircraft inspector of the Department of Commerce.

This plane has a maximum power loading of 59 lb. per sq. ft. and a maximum wing loading of 13 lb. per sq. ft.

Preliminary flight tests have indicated that the Xanth will be of very high efficiency when compared with any previous plane of similar size. In tests conducted with the plane



Perspective view of the Xanth Aircraft

light it has shown the ability to fly successfully on only 50 horse power and it performs easily on any five engines.

The manufacturer's specifications of the Xanth aircraft are as follows:

Length	20 ft.
Span	35 ft.
Chord	14 ft.
Height	18 ft. 8 in.
Airfoil	NACA 2412
Wing area	1,625 sq. ft.
Alouette area (each)	25 sq. ft.
Fin area	145 sq. ft.
Stabilizer area	25 sq. ft.
Rudder area	35 sq. ft.
Total area of elevators	34 sq. ft.
Wt. of plane (light)	4,000 lb.
Wt. of wing	1,300 lb.
Wt. of fuselage (complete with fittings)	2,800 lb.
Shock absorber	Aerial type PC-4
Wing loading (12,000 lb. load)	33 lb. per sq. ft.
Power loading	26 lb. per sq. ft.
Engines	3 x 125 hp. Ryan-Sumner 125
Fuel capacity	150 gal.
Oil capacity	120 gal.
(Actual performance with two pilots 175 gal. of gasoline)	
20 gal. of oil)	
Landing speed	25 mph
High speed	30 mph
Low speed	20 mph
Climb	2,000 ft. 4 min.
Estimated performance with full commercial load	
Take off	90 ft.
Landing speed	30 mph
High speed	35 mph
Climb	2,000 ft. 4 min.
Ceiling	20,000 ft.

A-M-L-O Lubricating Oil

New Product Has All Advantages of Coming From Pure Paraffin Base Crude Oil and is 100 Per Cent. Wax Free

By F. B. BOSTOPH

Staff Reporter Texas Pacific Coal and Oil Co.

DURING THE late war, when Texas was coming to be known as "the land of flying" it was also gaining recognition as a "land of oil," for at that time the prospectors of the drill were refining their dreams with producing oil wells that have since made the Texas oil fields famous. Therefore it is perhaps only fitting that Fort Worth, Texas, should be the home of what is believed to be the first lubricating oil developed especially for aircraft engines.

The men who are responsible for the development of the new oil, which will be known as "A-M-L-O" (Aircraft Motor Lubricating Oil) worked for several years to produce the lubricant. They finally discarded the possibility of ever marketing A-M-L-O for automobile or tractor use. As the oil was predestined for use only in aircraft engines, strict standards of perfection were set.

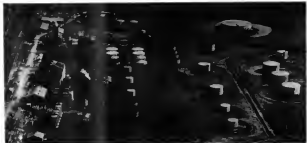
Can be Used in All Weather

To begin with the Texas Pacific Coal and Oil Co., developer and marketer of A-M-L-O, recognized the fact that paraffin base oils are better lubricants for aircraft engines than oils made from crudes of asphalt or napthen base. Although the fact has long been recognized by many of the leading

lubricating engineers, the theoretical use of paraffin base oils has heretofore been restricted to the summer season. In colder weather it has been necessary to sacrifice the better lubricating qualities of the paraffin oil and substitute asphalt or napthen base oils for their greater fluidity. From this knowledge it is evident that the ideal aircraft lubricant is one refined from a high grade paraffin base crude oil and made 100 per cent. wax-free so that it can be used with perfect safety in even severe weather.

Ideal Lubricant 100 Per Cent. Wax Free

Several years ago the technical staff of the company set out to develop such an all weather, aircraft lubricant. The manufacturers recognized the fact that little would be accomplished by merely lowering the wax residue. The issue before them was to entirely eliminate all wax. Wax has no lubricating value, and serves no good purpose in an internal combustion engine. It is also a distinct lowering the viscosity of an oil at the operating temperature of the engine. For a long time many paraffin base oils which contain only a small amount of wax have been on the market; but even so not having a pour test as low as 16 F. means approximately 115 per cent. wax and is not safe for use in cold weather. What the officials of the company consider as a perfect aircraft engine lubricant could not become a reality until a me-



Partial view of Texas Pacific Coal and Oil Co.'s refinery in Fort Worth, Tex.

that was devised to make paraffin have lubricating oil of permanent quality 108 per cent. wax-free.

It was also recognized that the best lubricants are those that contain the hydrocarbons in an unsaturated state. Most oils are bleached products, made by mixing light and heavy oils. But the ideal oil should be blended. It must be a direct still product, run directly from the stills so that the hydrocarbons would be in their natural state.

The Texas Fuel, Coal and Oil Co. was particularly well fitted to undertake this important task. To begin with it has its own oil wells which produce the world recognized 100 per cent. Pure Paraffin Base Ranger Crude. This oil is naturally gathered by an exclusive pipeline system and brought to the refinery unaccompanied by other crude oils. The refinery, which handles only this one crude oil and of the latest modern design in the country with special equipment not found elsewhere.

Special Equipment Installed

Before the motor's work had been under way here it was discovered that additional fuel cooling and oiling equipment were necessary to produce a wax-free oil suited for the most severe service known, i.e. aircraft engine lubrication. It was necessary to install special devices, build and install them before the work could continue to its successful completion. Long before the last part of this special equipment began operation, the company announced the production of A.M.L.O. (which the company's officials consider merit or credits every required specification for an engine lubricant), has all the advantages of coming from pure paraffin base crude oil and is 100 per cent. wax-free.

Performance tests have proved that A.M.L.O. can be used during all seasons in all temperature conditions, and that it forms an unbroken film over all moving parts at starting temperatures, regardless of the weather. Because of these properties, together with its high viscosity and exceptional purity, these oils have put it to every test state that it finds, and longer than any other oil they have ever used. For these and other reasons, those in the position to know have predicted that A.M.L.O. will revolutionize aircraft lubrication.

Marines Use Vought Corsairs

For Rescue Work in Nicaragua

WITH THE delivery of a number of Vought "Corsair" planes to the Marine Corps operating in Nicaragua, the Marine Aviation Unit there, under the command of Major R. E. Russell, has become one of the most effective weapons against the rebels. These high performance planes, the entire November production of the Chance Vought Corp. plant and delivered under urgent orders from the Navy Department, were received in Nicaragua during December and immediately placed in action.

These are planes, have been used successfully for bombing and "strafing" the rebel positions, causing heavy damage and keeping the rebels well under cover. They have also been used to make flights for observation purposes, thereby keeping clear account of all rebel movements.

Lieut. C. F. Schilt Transports 18 Marines

One of the greatest feats known in aviation aviation was recently accomplished by Lieut. C. F. Schilt of the Marines with the assistance of a "Corsair" plane. During one of the recent battles with the Rivasistas forces at Quibola, 18 Marines were injured, nine of them severely, including Capt. Richard Livingston and Lieut. Maxwell A. Barker. As proper medical facilities were not available to care for the wounded at Quibola, Captain Livingston in charge of the unit was able to

get a message through to Headquarters that immediate evacuation of the wounded was necessary to save their lives. The country surrounding Quibola is extremely wild and possibly only by foot and with pack mules.

The message was transmitted to the Aviation Unit and planes were dispatched immediately with packs and chairs, which were dropped at Quibola to be used in the preparation of some kind of landing field. The only fairly level spot in



Vought Corsair with Pratt & Whitney Wasp engine and in the area used by the Marines in Nicaragua

was around was the road through the middle of the valley which was only 15 ft. wide with a three foot ditch through it. The entire shade, all trees, etc., on one side of the road were demolished and a very rough runway only 300 ft. long was the best that could be obtained. There was a high hill at one end and trees and a ditch at the other end of the emergency field with a 3,000 ft. mountain just across the river.

Assisted by Lieutenant Seabree

After obtaining Major Russell's approval, Lieutenant Schilt started off with his Vought "Corsair" plane with one Pratt & Whitney Wasp engine. The first attempt was unsuccessful but on the second try Schilt brought the plane into the field stopping just short of the ditch at the end of the field. It was greeted as "An Angel from Heaven" by the 18 Marines there. After the hard landing a careful examination was made of the plane and everything found intact, and the next job was to take off. Lieutenant Schilt, who had a bad leg wound, was taken aboard, the wing tips held up, the engine was speeded up, the plane released and gradually sped down the short field took off successfully after it became the "Wasp" engine pulling the plane out of the field almost like a helicopter. The next job was to deliver the 18 Marines from the rebels who were firing at the plane from its position on all sides of Quibola, and this was done very fully with the help of Lieutenant Seabree who had been flying overhead in an escort plane firing on the rebel positions.

Captain Livingston, who also had been badly wounded, was taken on the next trip, and then 16 injured men in a lot of 32 trips. Some of the less severely injured were carried out two at a time. On the eighth landing the last shell casualty was carried away and the plane took off without the difficulty of landing on the rubber, and on the ninth trip an emergency signal was being strung across an area as well as wrapped with upstate and wire.

All of the wounded men were taken to Quibola, some 50 mi. from Quibola, where they were loaded into a large transport plane and taken to the hospital at Managua. The bravery and skill of Lieutenant Schilt, his confidence in his co-pilot, and the high performance of his "Corsair" plane in the emergency cannot be pressed too highly.

The MARINES and the "CORSAIR" in NICARAGUA



Vought "Corsair" (Wasp)

Insert—Lieut. Frank Schilt

"The engine ('Wasp') pulled the plane out of the field almost like a helicopter"

Lieut. Frank Schilt

Lieut. Frank Schilt, U. S. M. C. reports that, in a Vought "Corsair," he rescued a number of wounded Marines in the mountains of Nicaragua after landing and taking off for a total of ten trips on a rough, quickly prepared run-way 70 ft. wide by 300 ft. long. This improvised field was entirely surrounded by dense forests and high, rugged mountains.

Low landing speed, coupled with quick take-off, is best exemplified in ships equipped with the air cooled radial engine, and is due primarily to low installed weight per horsepower. In hard service flying these characteristics are vital to the practical use of aircraft during actual engagement where perfect landing fields are never available. These same engine characteristics provide for the unmatched performance of the "Wasp" at altitude, and corroborate the reasons for the "Wasp's" excellence in comparison to relatively heavier types of power plants.



THE
PRATT & WHITNEY AIRCRAFT CO.
HARTFORD, CONNECTICUT

DEPENDABLE ENGINES

N.A.C.A. Publishes Translations On German Glider Construction

THE NATIONAL ADVISORY COMMITTEE for Aeronautics has published two very interesting monographs on gliders by Alfred Struck, Technical Maintenance, numbers 433 and 434 entitled "Some German Gliders of 1923-1927" and "Glider Construction and Design" respectively. These papers are from "Der Geist und Geistiges" published by Richard G. Schmidt & Co., Berlin, Germany, 1925. Dwight M. Miner of the National Advisory Committee made the translation.

The National Advisory Committee for Aeronautics is to be commended for this step in helping to further interest in gliding and soaring flight in this country. This art which is so far advanced in Germany is almost entirely neglected in this country. Besides being very instructive gliding is claimed by those experienced in the field to be a sport that is hard to rival. It is understood that these articles are to be followed by some more on this same subject.

Waco Plane Distributors Discuss 1928 Plans in Meeting at Troy, O.

DISTRIBUTORS OF the Waco planes recently met with company officials at the Advance Aircraft Co., Troy, Ohio, to discuss the accomplishments of 1927 and to outline sales plans for 1928. The meeting was called to order by Sales Manager C. F. Van Stryken who spoke to the distributors on sales methods and plans. A general discussion followed.

This meeting of the distributors, the first of its kind ever called by the company, proved extremely successful and was called by the company, "the most successful of the company covering the 1928 production and out to the distributor organization, the sales system is functioning well and a good year is expected."

The Advance Aircraft Co. reports that figures on Jan. 2, 1928 showed an increase of more than 200 per cent. in daily production over Dec. 1, 1927. Five planes daily are to be built during the first 90 days of 1928, with an increase of daily output as fast as possible thereafter. New plants and field facilities are under way to meet this production plan. Large quantities of the new cylinder Ryan-Waco radial engine will be used, it is said. Other types of similar type are also being considered. There will be used, according to officials, as soon as their performance proves their worth.



Waco distributors and officials of the Advance Aircraft Co. who recently met in Troy, O. Back row left to right: A. E. Conrad, Dale Moxley, E. N. Brown, Clyde Shindler, Frank Glavin, R. G. Dill, Edward Chamberlain, M. E. Gilchrist, F. Claude Ryan, C. F. Myer, Center row: Frank Schumaker, J. H. Shelton, E. E. Green, F. C. Gault, Dick Young, Alfred G. Knapp, Ellis Harvey, John P. Wood. Front row, seated, C. F. Van Stryken, E. M. Egan, P. H. Spencer, Joseph Stevens, C. J. Brubaker, E. M. Brown, Charles Probst, H. C. Young, Ted Loftis, and John Longmire.

Fischer and Jacobs Developing Seven-Cylinder Radial Engine

FISCHER AND Jacobs, automotive engineers of Philadelphia, have turned their attention to aeronautics and are engaged in developing a seven-cylinder radial, air-cooled, one-crank engine.

First flying tests are expected about April 2, with engines mounted in either a Waco 30 or a Pietenor PA-4. If the Waco is chosen, the tests will be made at the Philadelphia Airport, 18th and Locust streets, where the Locust Philadelphia Flying Service has the agency for Waco planes. If the PA-4 is used, the tests will be made at Patterson Field, Willow Grove, Pa., near Philadelphia.

The new power plant weighs 335 lb. as a maximum and is being designed to produce 120 hp. at 1,800 r.p.m. Work has been going forward for the past eighteen months under the direction of A. B. Jacobs, secretary-treasurer of Fischer and Jacobs and the company's chief engineer. Henry M. Fudge, another engineer, is associated with Mr. Jacobs in developing the new engine. H. D. Carpenter is president of the company.

When the engine is completed a duplicate will be turned over to the Naval Aircraft Factory at the Philadelphia Navy Yard for extensive Navy tests, Mr. Jacobs said. Fischer and Jacobs, he stated, are developing the engine to fit the demand that will arise for an engine similar to the fast appearing OX-5. No details of the new engine will be announced until after it has successfully passed its flying tests.

Wichita's Seventh Plane Company To Begin Production of Biplanes

PRODUCTION OF a biplane of conventional design is now so begun in the factory owned by the Lark Aircraft Corp. at Wichita, Kansas, according to reports. The corporation—the seventh aircraft manufacturing concern in Wichita—is headed by Walter G. Barr, O. C. Baldwin is vice-president and associate engineer, and Fred G. McCoskey, president of the Wichita Aero Engineering Service, is the chief engineer. The latter was formerly connected with the air mail service and during the World War was a government airplane inspector.

Glen E. Garton, a University of Wichita student, is secretary and treasurer. Eomer G. Wayland, pilot, Roy E. Stroud and John P. Gleson are others in the corporation.



"Daylight at Night" Illumination produced by B. B. T. Air Mail Type Landing Floodlight

Intensity

An intensity of illumination that approaches the conditions for landing in daylight is essential for safe night landings. Maximum intensity insures the maximum safety.

The B. B. T. Air Mail Type Landing Floodlight illuminates the entire airport.

Landings may be made on any part of the field and in any direction. Surrounding trees, buildings and other low obstacles, are made clearly visible to the pilot. This all insures safety.

Eventually every airport will require this most economical and efficient floodlighting.

The intensity is the maximum produced for airport illumination. It covers the largest area. Absolute freedom from glare is provided by a newly added feature. Adequacy for the future is assured.

Every airport lighting requirement is provided by B. B. T.—Beacons, Boundary, Obstacle and Ceiling Lights, Landing Floodlights and Exterior and Interior Hangar Floodlights.

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{CATALOG GRADY FORWARDED UPON REQUEST}

B. B. T. CORPORATION OF AMERICA



Beckwith Havens Becomes Sales Manager of Loening Corporation

BECKWITH HAVENS, former aviator, recently became sales manager of the Loening Aeronautical Engineering Corp., giving up his active direction of Avships, Inc., of which he was vice-president. Entry of the Loening Aeronautical Engineering Corp. into the commercial field with a series of passenger airplanes developed from successful military types comes at the time Mr. Havens assumes the duties of his new position.



Evelyn Havens, sales manager of the Loening Aeronautical Engineering Corp.

with the declaration of war, to become an officer in the Naval Aviation service.

"The steady growth of commercial aviation is now assured," says Mr. Havens, who has lately spent several weeks surveying the field for the commercial airplane. "We know that there are no longer any barriers in growth." "As for the Loening airplane, we have two distinct elements for output. One is among the naval service airplanes whose design includes flying over both land and water, and the other is a class of light airplanes which will find a use for this type of plane."

There have been three phases in the development of the Loening airplane. First came the service airplane which used the inverted water-cooled engine and reached a degree of standardization with the Liberty and Packard engines. Second came the air-cooled airplane built around the Pratt & Whitney Wasp engine. The new Loening Amphibian with air-cooled engines now offered in the commercial field represents the third stage.

Price of Alexander Eaglerock

Increased to \$2750 on Feb. 1

PRICE OF THE OX's original Eaglerock will be raised to \$2750 on the former Feb. 1 and after Feb. 1, according to a recent announcement of the Alexander Eaglerock Co. Additional features as standard equipment now embodied in the plane such as dual control, reinforced landing gear, side door and flaring engine have increased the price from the former price of \$2475. The company announces, however, that the Eaglerock plane the new standard equipment but less the engine will sell at \$2000 discount.

Young Expects Plane Production To be Double or Triple in 1928

EXPECTATIONS THAT the airplane production of the country during the present year will be double, and possibly triple, that of last year, has been expressed by Cyrus M. Young, Director of Aeronautics, Department of Commerce. The total production for 1928 has already been recorded in the first month of 1928. The airplane manufacturing industry proper reported 1,350 planes produced in 1927, one-third of the industry has reported 1,500 planes produced thus far this year with 1,550 unfilled orders.

The Correct Weight of the New Miller 130 Hp. Engine is 300 Lb.

DUE TO an error in the Jan. 16, 1928, issue of AVIATION the wrong weight was given for the new air cooled 130 hp engine being developed by Harry A. Miller, Inc., of Los Angeles, Calif. The engine weighs 300 lb.

S. C. Breder is Appointed General Sales Manager of Mahoney Corp.

"SAM" C. BREDER, for eleven years in the toy and sub toy industry on the West coast, former Air Service man and in close touch with aviation since the World War has been appointed general sales manager of the H. P. Mahoney



S. C. Breder, new sales manager of the H. P. Mahoney Aircraft Corp.

Aircraft Corp., holder of the "Patent of the Airplane" awarded to Wood Merrill Dunn, San Diego, Calif.

Mr. Breder explains a J. P. Edwards who has accepted a similar position with another company. Previous to this Mr. Breder had been acting in an advisory capacity with the Mahoney proposition and thus was in good position to take over his new duties.



Consolidated Instrument Company standard equipment on a plane since 1927.

How Many Planes in 1928?

Consolidated Instrument Sales forecast a great year for aviation

CONSIDERATION instruments have been selected as 1928 standard equipment for the plane of 32 of the approximately 40 manufacturers of commercial airplanes who actually are in quantity production. Our business, therefore, is an accurate barometer of aircraft manufacture.

It has been estimated that about 1700 commercial planes were produced in 1927. Our present rate of actual deliveries of instruments sets in on the basis of equipment for 3000 planes.

Furthermore, a number of our customers are calling for deliveries 30% in excess of their original orders.

These figures forecast a record-breaking year for aircraft production. And they indicate, too, that the industry of commercial planes will course the highways of the air with the dependable guidance of Consolidated Instruments.

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The type F Star Pad altimeter is of the magnetic type and represents the latest development in aircraft compasses. It has a hydro-magnetic unit design using the use of trouble-free bar magnets. This



is a readily accessible for adjustment by means of a removable cover plate. This compass means that with the instrument board surface it has a spherical magnet lying over less shielding great visibility.

Altimeters, Tachometers, Oil Pressure Gauges, Gasoline Gauges, Thermometers, Air Speed Indicators, Compressors, Non-rotation Lights, Landing Lights, Dash Lights, etc.

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Seating Capacity pilot and 4 pass.
Wings Empty 230 sq. ft.
Span 42 ft.
High Speed (sea level) 120 M.P.H.
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EQUIPMENT

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The Ideal Commercial Plane

Price \$12,500 Flyaway
Completely equipped

BUHL AIRCRAFT CO.
Marysville, Michigan

Pacific Air Transport Control Acquired by Boeing Airplane Co.

PURCHASE OF controlling interest in the Pacific Air Transport Company, holder of the Pacific Coast air mail contract, by the Boeing interests of Seattle has just been announced. The PAT company will continue to operate under its old name and its policies will not be changed. However, an expedient development of modern air mail and passenger business is planned.

At the meeting of Portland, Seattle and San Francisco officials of the two companies held in Portland on January 18, P. G. Johnson, president of the Boeing Air Transport Co., and general manager of the Boeing Airplane Co., was named president of the PAT company. Vernon C. Board of Portland, former president and founder of the company, became one of the new vice-presidents.

Other officers of the reorganized company are A. R. Hinkley, San Francisco, former PAT officer, vice-president; C. L. Hinkley, San Francisco, former Boeing Airplane Co. vice-president; R. C. Brodshaw, Portland, secretary; W. C. McKee, San Francisco, of the old PAT company, assistant treasurer; and C. E. Black, Boeing general engineer, auditor.

The new board of directors is made up of W. E. Boeing, chairman of the board of directors of the Boeing company; Gertrude Johnson, Hinkley, Brodshaw and Julian L. Munn and J. C. Auerbach, both of Portland.

Corporate headquarters will remain in Portland and operating headquarters is in San Francisco.

Contrails for four new passenger planes have been let to the Boeing Airplane Co. These will cost \$25,000 each and will be added to the PAT fleet of twelve new air services between Seattle and Los Angeles. The new planes will accommodate four passengers besides the pilot and load of mail. They will be powered with Pratt & Whitney V-type engine. The planes are similar to those now being operated by the Boeing Air Transport on the Chicago-St. Louis City line of the transcontinental air mail line.

Three Engined Fokker Remains in Air Within Three Hours of Record

AFTER A 513 attempt to break the world's endurance record in a Fokker tri-engine monoplane Capt. Charles Kingsford-Smith and Lieut. George R. Pond were forced down in southeast Asia after a sustained flight of 50 hr. 4 min. They were 9 hr. 34 min. below the record now held by the German aviators Eder and Boshes. In order to break the record one must surpass the present mark by at least one hour. In last week's issue of AVIATION the plane was described in detail mentioning the first four attempts that had been made for the record. On Dec. 29 they landed after a flight of 48 hr. 27 min. which was then believed to be a record for three engined planes. Additional fuel tanks were installed and on Jan. 18 they completed their 513 attempt to break the world's endurance record. It is believed that this run of 50 hr. 4 min. has never been approached by any three engined plane.

According to reports when they took off from Mills Field, San Francisco, Calif., the plane weighed 10,739 lb. and it had a wing area of 742 sq. ft. and was powered with three Wright Whirlwind engines, the wing loading was 23.2 lb. per sq. ft. and the power loading of 23.3 lb. per hp. (rating for Wright J-5 engine at 235 hp.). The plane took off with 1,320 gal. of gasoline and therefore had an average consumption of 30.5 gal. per hr. for all three engines. In the last 24 hr. 1,000 gal. of gasoline were consumed while in the remaining time of

546 gal. were used. This meant a total fuel consumption of 33.5 gal. per hr. for the first day and only 17.9 gal. per hr. for the remaining time when the load was reduced.

This sort of over 50 hr. with a three engined plane is an unheard-of achievement and speaks very well for the men who required the plane for this test. It was a real test for the equipment which showed up in an excellent manner. It must be mentioned that there were three times the engine installed on a plane of this type when compared with any of its sister counterparts for the endurance record. The plane as "typical of California" was subjected to a very heavy load and it stood up exceptionally well. Philip C. Selmon was flight engineer for the project.

Arkansas Aircraft Co. Testing Plane Designed by Voellmecke

TESTS OF a new three place biplane are now being made by the Arkansas Aircraft Co. of Little Rock, Ark., according to a recent announcement by that company. The plane is designed by Albert Voellmecke, lately a member of the staff of the Heinkel Aircraft Works in Germany, who has been the position of technical engineer and designer with the Arkansas organization.

Although particulars will be able to obtain the new biplane with the Curtiss OX-5 engine, the plane is presently designed in modern production power plants of greater horsepower. Country production is to begin at an early date, according to officials, who report that the Little Rock factory is being equipped with new machinery following favorable showings of the biplane in the first tests.

Sturdiness and lightness of controls, streamlines, offering moment resistance, and many safety factors are reported to be included in the design of the airplane. The trade name "Command Ace" will be used.

A. J. Edwards to Tour Country As Sales Manager for Prudden

A. J. EDWARDS, who recently became sales manager of the Prudden-San Diego Airplane Co., manufacturer of the first tri-engined all-metal airplane to be constructed in the West, leaves San Diego on Feb. 1 to make a tour of the United States in a Prudden all-metal plane for the purpose of laying a sales foundation for this product. The plane is an eight place, dual control, tri-engined machine.

This tour is a step in the company's plan to manufacture all-metal airplanes on a large scale. The first plane made has been thoroughly tested, and satisfactory has been achieved, it is now making many service and civilian flights in San Diego. A single-engined six place plane is also being considered by the Prudden company, according to reports.

My Edwards came to San Diego from Muskegon, Mich., where he was organizer and president of the Muskegon Arm-



A. J. Edwards, sales manager of the Prudden-San Diego Airplane Co.

A single-engined six place plane is also being considered by the Prudden company, according to reports.

My Edwards came to San Diego from Muskegon, Mich., where he was organizer and president of the Muskegon Arm-

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THE SPERRY GYROSCOPE COMPANY
BROOKLYN, N. Y.

ton Club. He first was manager of the B. F. Mahoney Aircraft Co., and eventually was the man who sold Cessna Lindbergh his internationally famous Spirit of St. Louis.

A thorough familiarity with aeronautical sales work has been gained by Mr. Edwards. He has sold American planes in the United States, Japan, Hawaii, Australia, and Alaska.

"I believe that the all-around manufacturer of airplanes is as rare as once as did the all-around fowling which has now replaced the monkey," said Edwards in a recent interview.

Plan Large Increase in Capital

Of International Aircraft Corp.

CAPITALIZATION of the International Aircraft Corp. is to be increased from \$200,000 to between \$500,000 and \$1,000,000 and incorporation is to take place under Ohio laws, according to a recent announcement of the removal of the corporation from Long Beach, Calif., to Cincinnati, O., where industrial leaders have taken over the company. Control of the corporation was purchased through the activity of Percy V. Dignan, who becomes vice-president and general manager. Arthur E. Ewald, Cincinnati capitalist, is president.

Production in the large new factories at Cincinnati is scheduled to begin Feb. 1 with Edwin M. Fisk, designer and power airplane engineer, continuing as chief engineer of the new corporation. All the machinery and most of the personnel of the Long Beach factory have been transferred.

The new plant location lies near the London Airport and the Wilson Airport. Three former government buildings of the Anne Nichols Plant sold during the World War, together with a concrete runway nearly a mile in length and a test field comprising 185 acres, make an ideal site for the factory. It is said that abundance of space will make this one of the largest commercial aircraft factories in the country.

One of the first sales territories allotted went to the Cincinnati Aircraft Sales, Inc., a new corporation formed for the purpose of establishing dealers in the Ohio Valley. Sam Albert Wonder is vice-president and sales manager of the latter corporation.

500 Super-Rhone Engines Ordered By Airplane Interests at Wichita

AN ORDER for 500 Super-Rhone radial airplane engines has been placed with Taps and Beach, Inc., manufacturers, by a group at Wichita, Kas., capitalists, according to a statement by J. C. Taps, Jr. Selection of this power plant is to be used in several of the planes built at Wichita and elsewhere in the vicinity was made following extensive test flights by W. B. Harrison, who recently completed his last long airplane flight, Jan. 24, at Wichita.

The first shipment of the engines, 200 of which are to be delivered before June 1, is now being made, Taps announces.

Change in Price of Challenger Announced by Kreider-Reisner

THE KREIDER-REISNER Aircraft Co., Inc., of Dayton, Md., manufacturers of the Challenger airplane, a winner that the price of their plane less air speed indicator, compass and fuel control is \$2795. These planes are built with complete equipment at \$2945 at the company's plant, Hagerstown, Md.

As the result of a printing error, *Aeronautics* stated the wrong price for the Challenger in a recent advertisement of the company.

Side Slips

By ROBERT B. OSBORN

It would like to have been able to present this week's "Side Slips" a complete copy of the conversation between Roger Williams and Clarence Chamberlin on their recent attempt across the world's endemous ocean, so they are, in our opinion, the shrewdest and wildest pair of fliers that ever got together. Chamberlin's mood is, of course, very well known everywhere, but there are some statistics concerning Williams' emotional manner which should interest everyone, and so this is a library of deciding some points in their discussion. Williams is connected with the Curtiss Flying Service and since the first of May he has put in over 3500 hours in the air, most of it being in instructing students on Jannet. During regular weather he averaged about 20 students per day and in bad weather. One day he had 22 hours of flying in 16 of 65 hours, and on one 16 day ground had 48 hours of 80 of time in the air. So, about the only difference between a regular work and an endurance flight was that he didn't sleep in between days to sleep and eat. As he explained it, a restriction was good training for the endurance attempt, and the least part of the time while instructing, relying on the high loadings his students would make him to make him up to be to give them the most handling out.

On a Thursday, Friday and Saturday he and Chamberlin spent only for nearly 12 hours. Reports to the plane were made on Sunday and on Monday morning they were up again in another flight. If they had managed to sleep up again for the 90 hours on this attempt they would have had the speed record of 122 hours flying in one week.

When they landed, on their second flight, that they were on their last wing-tank full of gas, they threw out "everything we could in plane" as he said along to slowly as possible. The baggage included a five gallon can of oil, a gallon of oil, thermos bottles, and flashlights. Williams said he would have thrown out Chamberlin's shoes too, but thought better of it, as "it would have meant more death to anyone to be out of them."

Chamberlin said that Williams' jokes were terrible along with the end and he finally had to pretend deafness—"Williams I can't hear what you're saying." Williams claimed that his partner became almost stone deaf whenever there was any work to be done, too.

Along about the middle of the flight the landing gear failed in one side, the famous "tin pants", rather loose and so of. Lewis Williams, who, with George West, hopes to take an endurance record, in a Bensen monoplane, says that Williams said he was warning to everyone not to buy a Bensen plane or extra pair of pants at thermos or with the plane. Williams said that he began to feel more at home in the plane after the vibration had put the rate-of-descent, altimeter and low-end-term instruments out of commission, as he had been in an airplane before that had all of its instruments making correctly.

But there explained to the reporters that their flight had not yet a preliminary test, that there had been some doubts whether they would be able to get along together for any "normal" lengths of time, and now that these doubts had been wiped, their next flight would be a real one. They're wishing those doubts!



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AIRPORTS AND AIRWAYS

SYNOPSIS, N. Y.

By Julia S. Fenderson

The work of the weather forecaster was explained at the last meeting of the Synoptic chapter, National Aeronautics Association, by Georges E. Beaufort, in charge of the United States Weather Bureau at Syracuse University. Mr. Beaufort discussed the weather man and his relation to aviation.

The forecaster explained that eight-tenths of all the storms that cross the United States blow out into the Atlantic over the heads of New York and New England's umbrella waters, whether the storm originates in Vancouver, San Diego, Tex. Juan, Dallas, New York, or New York.

He said that there are atmospheric conditions which may affect our moving east. An upsurge of warm air, for instance, might eliminate a rain storm in its vicinity.

Mr. Sandford explained for the Bureau the formation of a cyclone and tornado, calling the latter apoplex standing on their heads ends. The cyclone, he said, is a circular storm formed something like a body's snuff with the snuff moving east although the wind goes in to the left. The tornado is of the same formation. Mr. Sandford explained, except that it slides along on end and is therefore a taller storm than the apoplex. An airplane could fly over either of these types of storms under normal conditions, he continued.

Mr Sanford was asked the possibility of such storms co-

correct in high air density but assumed the question: *What is the effect of air density on the ground floor proposition and on second storey proposition?*

The instructor further explained the formation of
but and asserted that probably the greatest man-
craft of today is the short storm. As an example the
even, the surplus can climb above the sheet, he said.

Mr Stanford's son, the first of a series of lectures arranged by the local chapter to constitute a ground school course for interested members.

Police Department to Have Plans

Lynxware will probably have the distinction, it is noted, of being the first American city to purchase an airplane for use of its police department, for an item of \$3,500 for the purchase of an airplane was included in the budget for 1938 submitted by Chief of Police Martin L. Cadin. The Board of Estimate and Apportionment gave its approval and the plane will be purchased in the spring.

Guidon, K. Howl, manager of the municipal airport here will be appointed pilot of the police plane. He will be five years old, and possibly the country's first official "boy cop."

Purchase of a police plane is considered by Symmes as here an positive proof of the air-mindedness of their city. Perhaps many other cities will boast of a fleet of police planes.

January 30, 1928

when a 100 years but as far as is known, Syracuse will be the last.

Chief Coffin, recommending that the city purchase an engine of the type of his department, called attention to the fact that speed is many times necessary in police work. The point closed as we knew it today as the car, the chief added.

The place in to be used in the pursuit of criminals and for preparing prisoners. It is planned that if a man wanted a license is arrested on another city the place will take of her on the same day, fly to where the man is held, and return her on the air.

A cracked spark plug ported Kennedy recently toward George Hainsworth, pilot of Ruth Elder's plane on its unsuccessful attempt to bridge the Atlantic, to land at the municipal airport here. He served unchallenged, taxed his Fordbird momentarily into the new municipal hangar, and registered at a hotel without revealing his identity.

It was not until the following morning when Haldeman and reporters about the management of the airport that his plane was released. He left shortly afterwards for Miami, accompanied by Mr. and Mrs. Richard E. White. Mr. White, a newspaperman, was invited to take the trip by Haldeman. Haldeman's plane was the first to leave the

Midwestern's top brass Syracuse to New York City was made in 2 hr. 45 min. A fresh tail wind helped him considerably on the flight.

Gracie K. Wood, manager of the airport, announced that planes from nearby cities have been landing at the municipal MIA throughout the winter. Contrary to expectations, the pit has been a busy place, therefore, despite the cold and dry weather.

Philadelphia, Pa.

Dr. Hans Krumm

Three Waco 18's and a Waco 30 triplane have arrived at the Philadelphia Airport at Island Road below Tindown Avenue as the first shipment in the order for 84 Wacos recently placed by Charles Townsend Lockington, president of the Lockwood Exhibition Co., airport house.

Robert P. Bessit, manager of field operations at the airport, supervised the unloading of the four disassembled planes, that have been stored in a large barn near the field. The two Lindbergh hangars at the field are already filled with planes, eight planes owned and operated by Philadelphia's big store in one hangar and the company's seven standard air operational planes being kept in the other.

The new Waves are expected to arrive here at the rate of 80 dismantled phones per month from the Advance Assembly Co., Troy, Q.

Recent flights by officers of the Twenty-eighth Division Air Group, Pennsylvania National Guard, included a trip to Ireland by First Lieut. Robert P. Hewitt and a flight to Brazil by Maj. J. Richard Owens, commanding the service. Both trips were made in one of the division's new Consolidated PT-18, of which it has two on temporary loan.

DeSantis is scheduled to receive three Custer 0-11 F-16s with Liberty engines, in February or March. Major

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planes announced. It will also get five advanced treaty planes at a later date.

Seven leaders in aeronautical circles throughout the country have been invited to an aviation rally to be staged in the Four Hundred Club, Philadelphia, advertising competition, in connection with its annual banquet (see story). Present there who will attend include Louis Comdr. Charles H. Wendell, captain of the naval dirigible Los Angeles; Capt. B. W. Waples, chief of the Navy's Aircraft Factory; Phil. Delphin N. Ford, Floyd Bennett, who accompanied Comdr. Richard E. Byrd to the North Pole; Bert Acosta, who crossed the Atlantic with Byrd; Clarence E. Chamberlin, who piloted Charles A. Levine from New York to Germany; Lt. Col. Lucius Marshall, non-stop flier between San Francisco and Hawaii; and Lt. Col. David Baldwin, North Pole flier. The addresses of the Baltimore-Atlantic will be translated into a wireless landing field. Leaders in the aviation industry will speak and there will be special aviation entertainment.

Erie, Pa.

The Aero Club of Erie, headed by President Harold F. Mack, has completed an educational aviation campaign to acquaint Erie's business and industrial leaders and the general public with the advantages of establishing a municipal airport.

As a result, a definite action toward procuring a site for such a field is expected to be taken by city authorities before summer. Inspiring trips to available sites have been made and general interest has been created.

J. G. Odoms, perhaps the best informed aviation enthusiast in Erie on airport requirements, has appeared before city representatives, service clubs, and other organizations, in placing the city's need for aeronautical activity and its benefits that could be expected if a municipal airport were established.

The Aero Club of Erie, having completed one educational campaign, has started work on another, this time directing its attention to surrounding communities. In addition to E. Morris, the club's efforts are A. W. Beuchert, vice president; H. H. Brown, secretary; and Howard Hudson, treasurer.

Johnstown, Pa.

Robert E. Waters leads the Airport Committee of the Johnstown Chapter of Commerce, which, for several months has been investigating sites for the establishment of a municipal airport.

Other members of the committee include George A. Fisher, W. W. Moore, Harold H. Heffer, Lewis Fawcett, W. W. Kneass, C. L. Eisher and W. W. Kneass. The committee is organized with Walter G. Shipley, always active in support of the Bureau of Aeronautics, who recently led a representative tour of available sites in and on the subject of Johnstown.

Mr. Shipley's report recommended as the most favorable site a stretch of land adjoining a golf course. This site is being given careful consideration by the city and definite action is expected within the next few months.

Scranton, Pa.

Assured by the interest taken in aviation, the Scranton, Pa., chapter of commerce has organized a committee to deal the problem of securing an airport for Scranton. William F. Hamilton of the Scranton Press is chairman of it. This project has pushed the airport project a step forward for several months, and an airport is now assured.

Members of the chapter of commerce were recently addressed by a representative of the Ford Motor Co. speaking the interests of aviation. A Ford-Terrill airplane, now to be exhibited on the market, had a change in plans since its arrival at the last meeting.

Redigan, Pa.

Redigan is working toward the establishment of a Municipal airport. Lewis Maza, Eddy D. Markle and A. Oscar Redigan have been appointed members of the Hamilton Chapter of Commerce Airport Committee, with Mr. Markle as chairman.

The committee has visited several prospective sites for the airport and is preparing a report on which the city will be asked to take action.

Spokane, Wash.

By E. News Service

Provision of a flood lighting system for the Spokane Airport has been estimated by the city officials. Lights were installed during the national air races but had only been turned on in the city and to the National Guard. City commissioners have arguments as to the necessity of having lights for the field and passed a temporary ordinance setting aside necessary funds.

Three new Wesco have been delivered to the Mayor Flying Service by the Boeing Flying Service of Portland, northwest distributors. Pilot Mark B. Manner flew the planes to Spokane from Portland.

During 1932 the Mayor Service, working off the Spokane Airport, contained 160 passengers, made 60 cross country trips including 24 over the Cascade mountains, and eight over the plane and two used mailplanes, and sold two engines. Plans of the service also look part in four aeronautical contests, including the Glenn A. Trueman contest air derby from New York to Spokane. Manner is his field service placed third in the derby.

Fifteen students were graduated and 20 were enrolled at the end of the year. Arrangements have been made whereby the ground school instruction will be given by the Institute of Tennessee and Seaton, with Pilot Manner acting as instructor in night school classes. The school has a total of 437 students enrolled. Air instruction is to be given by Mr. Manner and his co-pilot W. W. Williams. The service work is being so arranged that students can learn to fly without interference by their regular employment time.

Winston-Salem, N. C.

By Robert Connelley, Jr.

Winston-Salem's first school of instruction in aviation was recently opened at Charles Field on the southern limits of the city, by G. B. Pope, and K. C. Carson, formerly of Los Angeles, Calif. Pope owns the Eaglehawk plane being used, and Carson is the instructor.

Mr. Pope has just been appointed Eaglehawk distributor for western states including Winston-Salem, serving under J. Kelly Charles, Richmond, Va., distributor in North Carolina, Virginia and District of Columbia.

It is understood that several local people have already made inquiries as to the instruction course and Pope says that he is supplying a comparatively large class within the next few weeks.

Mrs. Helene Meyers Jordan, past owner of Advance Aircraft Co., Troy, Ohio, is spending a week in Winston-Salem this month. She formerly made her home here.

Mr. Jordan is popularly known as "Mac. Waco". She is a sister of Charles Meyers, owner of the New York-Spokane air derby and now test pilot for the Waco company. She told Jordan here that her company is planning additions to its plant that will increase production to about 3,000 planes monthly.

J. Kelly Charles, Richmond, Va., Eaglehawk distributor, has returned to Richmond, after spending the holidays in Winston-Salem. He flew here in an Eaglehawk which he delivered here to a purchaser at Raleigh. He stated that he had enjoyed

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